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CHEMICAL & ENGINEERING

NEWS

Chemicals used in winemaking
Page 19
PRELIMINARY PROGRAM
ACS spring meeting in Denver Page 35

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**Mary L.
Good**
ACS President
Page 2



News of the Week

■ R&D expenditures in U.S. will rise 7.4% in 1987, according to Battelle Columbus Laboratories' annual R&D forecast. **Page 6**

■ Job market for new college graduates in 1987 remains flat, except for graduates with degrees in chemical engineering or chemistry where demand is up. **Page 7**

■ Chemical Abstracts Service donates its entire backfile of *Chemical Abstracts* issues and *Collective Indexes* to Los Angeles Public Library, a victim of two arson-related fires. **Page 7**

■ Councilors in Region V select candidates for upcoming election to fill vacancy created by the death of director Robert C. Brasted. **Page 7**

Business

Vinyl chloride, styrene, and toluene diisocyanate plants operate near capacity as demand surge takes producers by surprise. **Page 9**

Government

Low risks concept is used increasingly in regulating cancer-causing chemicals; however, concept is rejected by libel court system. **Page 14**

Technology

Johnson Wax, a major producer of specialty chemicals and still a privately held firm, celebrates 100 years of existence. **Page 16**

Science

Synthesis of gene that encodes the heme protein cytochrome *b₅* aids study of cytochrome's characteristics. **Page 17**

Link between cancer and thyroid hormones receptor is found by two groups of researchers. **Page 18**

Updated data on academic science/engineering are now available from NSF's division of science resources studies. **Page 18**

Preliminary Program

Highlights of 193rd ACS National Meeting to be held in Denver in April include division symposia, advance registration coupon. **Page 35**

Cover: Photo by Greg Pease

President's Message	2
Letters	4
Editor's Page	5
Concentrates	
Business	8
Government	13
Science/Technology	15
The Departments	
ACS Comment	29
ACS News	31
Newsclips	64



Special Report

Chemical additives used in the production, storage, and shipping of wines are an integral part of winemaking. **Page 19**

R&D FUNDING OUTLOOK: Battelle forecasts 7.4% rise in 1987

Research and development expenditures in the U.S. will amount to about \$127.4 billion in 1987, Battelle Columbus Laboratories says in its annual R&D forecast. That figure represents an increase of 7.4% over the \$118.6 billion the National Science Foundation estimates was actually spent for R&D in 1986.

According to Battelle economists Jules J. Duga and W. Halder Fisher, who prepared the forecast, part of the increase will be absorbed by inflation, which they estimate at 3% (for R&D) in 1987. Thus the real

increase in R&D expenditures would be about 4.3%, slightly higher than the 4.26% average annual growth rate over the past 10 years.

Of the \$127.4 billion, industry is expected to furnish \$63.8 billion (50% of the total, and a 7.2% rise from 1986). The federal government will provide \$59.5 billion (46.7% of the total, up 7.6% from last year). The remainder will come from academic institutions (\$2.75 billion, or 2.2% of the total) and other nonprofit organizations (\$1.45 billion, 1.1% of the total).

During the past decade, the annual compounded rate of real growth in R&D support has averaged 5.3% for industry and 3.3% for the federal government. Duga and Fisher point out that the growth in industrial funding has been a recent trend; until 1979, the federal government supported more R&D than did industry.

Four government agencies—Department of Defense, Department of Health & Human Services, Department of Energy, and National Aeronautics & Space Administration—will account for 92.7% of total federal R&D spending in 1987. This amount is about the same as the 91.5% for the four agencies in 1986. The forecast notes, however, that the allocations among the four will change significantly in 1987.

DOD will fund about 70% of the federal total, compared with 65% in 1986. Most of the increase in R&D will involve acquisition of major weapons systems.

DOE will fund 7.6% of the total, down from 9.5% in 1986. The cut will mainly affect energy supply and conservation programs; defense-related efforts and general science programs won't be hurt very much.

The loss of the Challenger shuttle and the resulting investigations

have affected NASA's entire operation, including the orientation of research programs and associated budgets, the forecast says. Although NASA R&D support will increase slightly in 1987, it will represent a smaller share of the federal total—6.3% vs. 6.5% in 1986.

There also will be "significant cuts" in support of the biological and health science areas, and a "continuing de-emphasis on research in the 'soft' sciences," according to the forecast. For example, the HHS share of the federal total will be only 8.9%, compared with 10.3% in 1986.

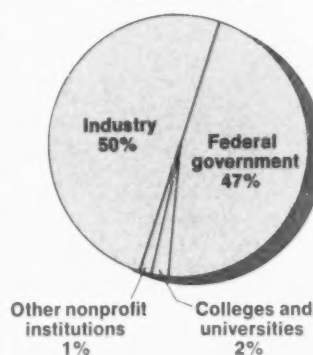
Regardless of the source of funds, private industry will, as usual, do most of the work. For 1987, "performance" by industry will account for nearly \$94 billion, or 73.5% of the total. Of the rest, \$14.7 billion (11.5%) will be done in-house by the federal government, \$15.5 billion (12.2%) by colleges and universities, and almost \$3.6 billion (2.8%) by other nonprofit organizations.

Among the industries, the aerospace industry will keep its usual lead, with performance of about \$23.6 billion in total R&D. Of that amount, almost 75% will be federally supported. The electrical machinery and communication industry will come in a close second, with total R&D performance of almost \$21.3 billion. But federal support will represent only 34.6% of the total. About \$10.8 billion will be spent on R&D for "chemicals." Of that amount, 97.1% will be funded by industry, only 2.9% by the federal government.

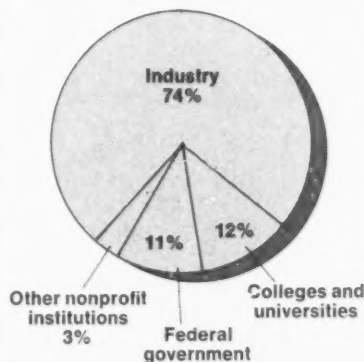
Although industrial R&D support has been growing, shifts in patterns seem to be emerging. In particular, the Battelle economists warn, the recent increases in mergers, acquisitions, and "restructuring efforts" may have a significant impact on industry R&D expenditures. □

R&D funding to reach \$127.4 billion in 1987

Source of funds



Performers of R&D



Demand Surge Surprises Plastics Intermediates Producers

With plants operating near capacity, vinyl chloride, styrene, and toluene diisocyanate face growing tightness in supply

Bruce F. Greek, C&EN Houston

Demand for three major plastics intermediates—vinyl chloride, styrene, and toluene diisocyanate (TDI)—rose far more in 1986 than producers and marketers had expected. Although some improvement over a small demand slump in 1985 was forecast, production gains of more than 5% were not anticipated. To meet demand for these intermediates, producers ran their plants at practical capacity through much of the year, occasionally going above effective capacity, but also being hit with unplanned shutdowns of equipment due to a variety of mechanical problems.

Improved U.S. demand and strong export demand have spurred output. The increased exports were particularly useful to producers in gaining higher prices late last year after declines earlier had accompanied falling crude oil prices. Domestic demand was strengthened by a combination of economic factors—moderate growth in consumption of products made from these intermediates and inventory rebuilding that resulted from lower interest rates and prospects of higher sales volumes.

Reports of tight supplies became widespread during the fourth quarter of 1986 as it became clear that the strong demand earlier in the year would not decline significantly. Slightly improved profitability and apparent tight supplies led to

talk of capacity expansions. Except for debottlenecking programs that are more extensive than usual, few expansions to make these intermediates are planned. Consequently, tightness of supply could continue for one to two years, depending on how cycles in the general economy influence demand.

The immediate future will reflect the higher demand growth and relatively stable capacity situation.

Key Chemicals

Prices likely will remain firm as long as a recession is avoided. Imports will rise and exports will fall, causing the net of exports over imports of the plastics intermediates to fall more rapidly than they otherwise would.

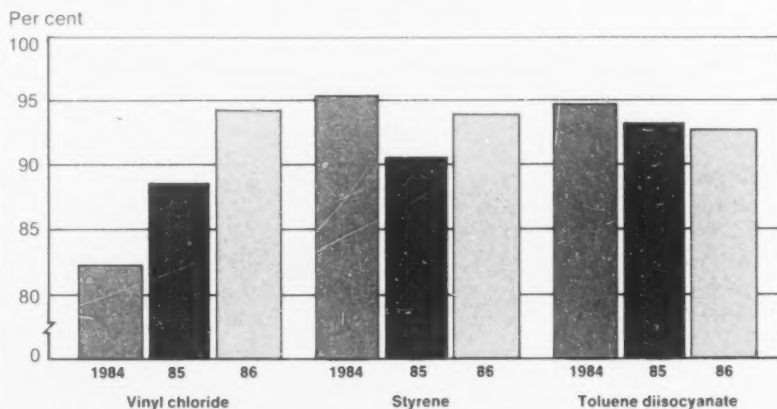
The foreign trade in these plastics intermediates remains a source of supply for domestic uses. In 1986, exports of each of the plastics intermediates accounted for more than

10% of their U.S. production. For TDI, it was close to 25% of production. Exports have been under pressure because of higher prices, but prices have been partially offset by the decline in value of the dollar in some importing countries where the currency is pegged to the U.S. dollar. Similarly, imports have been rising, from small bases, however, because of firming prices in the U.S. long-term export commitments.

Competition to U.S. exports of vinyl chloride has been growing as the result of completion of new capacity in Saudi Arabia. Production from the new capacity is expected to be either polymerized on site or exported to polymerization plants in Far Eastern countries whose polyvinyl chloride requirements have been rising rapidly. In addition, plant expansions in other parts of the world where these intermediates are made could put a downward pressure on U.S. exports.

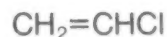
For details of the near-term outlook for these plastics intermediates, see the following pages.

Operating rates for plastics intermediates continue high



Sources: International Trade Commission, C&EN estimates

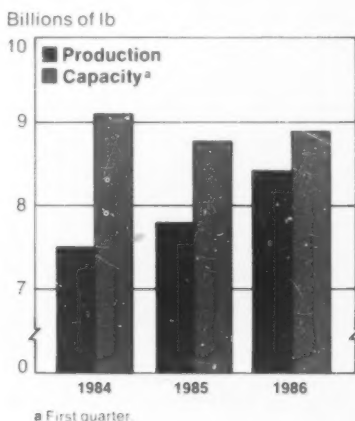
Key Chemicals



Vinyl chloride

- **Demand well up**
- **Capacity steady**
- **Prices raised**

PRODUCTION/CAPACITY



MAJOR PRODUCERS

Borden Chemical, Dow Chemical, Formosa Plastics, Georgia-Gulf, B. F. Goodrich, PPG Industries, Shell Chemical, Vista Chemical

HOW MADE

Dehydrochlorination of ethylene dichloride made by reacting chlorine or HCl with ethylene

MAJOR DERIVATIVES

Vinyl polymers almost 100%

MAJOR END USES

Fabricated plastic items almost 100%

FOREIGN TRADE

Exports—rising to 1.5 billion lb,
imports—rising to 200 million lb

PRICE

16 to 17 cents per lb

Vinyl chloride production set a surprising pace last year. The record output would be even higher if more plant capacity had been available. Despite high production, strong domestic and export demands have caused tight supplies. Prices have risen about 10%, but additional hikes are expected in 1987.

Fourth-quarter 1986 production of vinyl chloride was forecast at slightly more than 2 billion lb. If the forecast holds, the 1986 total output will exceed 8.4 billion lb, up more than 600 million lb from the 1985 volume of 7.8 billion lb, an increase of nearly 8%. Output also showed unexpected strength in 1985, rising from 7.5 billion lb produced in 1984 in what had been forecast as a weak year for vinyl chloride.

Output in 1986 did not follow historical patterns and rose more than had been forecast. First-quarter production, at slightly more than 2 billion lb, met many forecasts based on the strong showing in late 1985. That was in line with historical production records that call for a strong first quarter to meet demand for polyvinyl chloride pipe resins needed for pipe going into the spring and summer surge of housing and commercial construction.

Second-quarter vinyl chloride production last year exceeded the first quarter by a small amount, which is not always the case but is not unprecedented. The relatively high output in that quarter was attributed to pipe demand's holding up because housing remained strong.

The third quarter traditionally has been the weakest quarter for vinyl chloride. But in 1986, output rose almost 11% over the second quarter, reaching 2.285 billion lb, according to preliminary estimates of the U.S. International Trade Commission. It is more usual for third-quarter production to decline 5 to 10% from the first and second quarters.

For the three quarters, vinyl chloride output totaled 6.38 billion lb, according to ITC preliminary estimates. With fourth-quarter production of 2 bil-

lion lb, the forecast total for the year of 8.4 billion lb will be met. Industry sources believe, however, that fourth-quarter output was more than 2 billion lb, and possibly 2.1 billion to 2.2 billion lb, which would lift the 1986 total to 8.5 billion to 8.6 billion lb. It is likely that the first quarter of 1987 will have about the same production rate.

The increased and unprecedented production rates for vinyl chloride last year hinted at continued tight supply. As 1986 began, capacity to make vinyl chloride was 8.8 billion to 8.9 billion lb. Minor debottlenecking during the year raised capacity a small amount but probably not enough to offset lost production due to unexpected plant outages during the year. At a maximum total production of 8.6 billion lb and operable nameplate capacity of 8.8 billion lb, average operating rate would work out close to 98%. A more conservative estimate would be 94%, based on 8.4 billion lb of production and 8.9 billion lb of capacity.

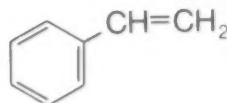
The apparent tightness in supply stems partially from export demand growth, the same outlet that might provide additional volume for U.S. consumers of vinyl chloride should producers choose to reduce exports in favor of U.S. sales. Exports in 1986 were forecast to reach 1.5 billion lb, or nearly 18% of production. Imports, also rising, offset exports about 200 million lb for a net of 1.3 billion lb, or 15% of production.

Vinyl chloride selling prices have risen about 10% from midyear 1986, as the production surge continued into the third quarter. More price increases are forecast for 1987. Currently, export prices are about the same as domestic prices for vinyl chloride, indicative of the supply situation. Profitability, however, has not improved very much because both ethylene and chlorine prices increased last fall. Nevertheless, future increases in vinyl chloride prices could stay ahead of raw material costs and finally relieve the low profitability for producers.

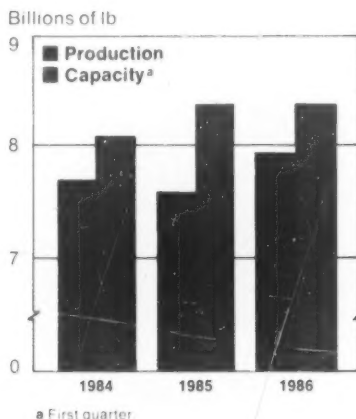
Key Chemicals

Styrene

- Demand stronger
- Capacity on hold
- Prices raised



PRODUCTION/CAPACITY



MAJOR PRODUCERS

Huntsman Chemical, Amoco Chemical, Arco Chemical, Cos-Mar, Chevron Chemical, Dow Chemical, Sterling Chemicals

HOW MADE

Dehydrogenation of ethylbenzene; coproduced with propylene oxide

MAJOR DERIVATIVES

Polystyrenes 65%, styrene-butadiene elastomers and latices 15%, acrylonitrile-butadiene-styrene polymers 10%

MAJOR END USES

Fabricated plastic and rubber products almost 100%

FOREIGN TRADE

Exports—holding at about 1.3 billion lb, imports—rising to about 250 million lb

PRICE

25 cents per lb

Strong demand for styrene is expected to continue during the early part of this year. In last year's second half, polystyrene demand proved to be stronger than expected, spurring its production. Consequently, supply has tightened, and producers are considering capacity expansions. Prices have firmed, allowing much of the price increases of feedstock benzene to be passed on.

Styrene output hit a record in 1986 of close to 7.9 billion lb. Polystyrene manufacture accounted for most of the production increase, with other uses logging lackluster performances. Estimated 1986 output was well above the 7.7 billion lb produced in 1984 and is a 5% increase over 1985 production of 7.5 billion lb.

When 1986 began, nameplate capacity for styrene was nearly 8.4 billion lb, providing sufficient supply to meet a modest demand growth of 2 to 3% expected for what generally is considered to be a mature product. At that time, no significant capacity expansions were imminent because of the long history of overcapacity for styrene. But now producers are shifting their attention to the tight supply situation.

As 1986 progressed, output was reduced by an unusual number of plant problems. Several of these production problems occurred at a time when some plants temporarily were down for routine maintenance. Thus about 10 days' production was lost by styrene plants during 1986. That loss reduced capacity for the year by about 200 million to 250 million lb, or about 3%.

With a 1986 capacity of 8.4 billion lb, and a projected output of 7.9 billion lb, the average operating rate was close to 94%, a very high level for styrene. A 3% capacity outage for the year would raise the operating rate to close to 97% of nameplate capacity, supporting current reports of tight supply. Additional maintenance shutdowns are scheduled for early 1987.

Price increases have resulted from

the current tight supply of styrene as recently as December and have led to rumors of further increases should benzene prices move above the mid-90s cents-per-gal level of last month. After the cut of 3- to 4-cent temporary voluntary allowances from the list prices of 28 to 29 cents per lb, most styrene sells for about 25 cents per lb, a price up nearly half from six months ago.

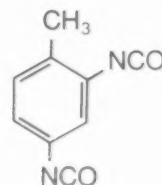
Exports of styrene in 1986, estimated to be near the 1985 level of 1.3 billion lb, probably declined slightly from 1985. Imports of styrene, although still relatively small, likely rose to 250 million lb, up about 25% over 1985. Higher prices will continue to lower net exports.

The major use of styrene—various straight and rubber-modified polymers—accounts for nearly 65% of its U.S. consumption. Growth of about 350 million lb in polystyrene's use of styrene was expected last year, easily covering the increase in styrene production. Large end uses of polystyrene, such as packaging and disposable items, are growing faster and provide much of the total gain.

Polymers of styrene and butadiene rank a distant second in uses of styrene. Demand for styrene-butadiene latices, used heavily as carpet backings, is growing slowly, aided by strong sales of carpet. Production of styrene-butadiene elastomers, used mainly in tires, fell last year because tire production continued to decline under pressure from the marketing of longer-life tires and from rising tire imports. Outlook for these polymers in styrene end uses is for little or no growth, interspersed with periods of decline.

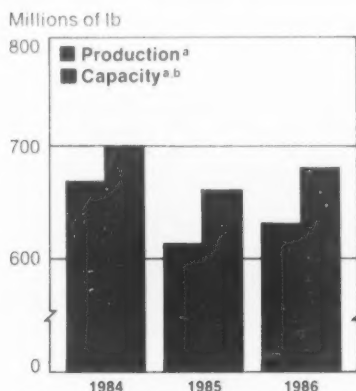
Other polymers—acrylonitrile-butadiene-styrene resins, unsaturated polyester resins, and a host of miscellaneous resins—take relatively small volumes of styrene. Some of the resins, such as the styrenic thermoplastic elastomers, are growing well, but from a small base. Hence, compared with polystyrene, their effect on styrene demand remains negligible.

Toluene diisocyanate



- **Demand up a bit**
- **Capacity to rise**
- **Price firmer**

PRODUCTION/CAPACITY



a 80/20 mixture of 2,4- and 2,6-toluene diisocyanate.
b First quarter.

MAJOR PRODUCERS

BASF Wyandotte, Dow Chemical, Mobay, Olin, Rubicon Chemicals

HOW MADE

Nitration of toluene, reduction to diamine, reaction with phosgene, and purification with recovery of coproduct HCl

MAJOR DERIVATIVES

Polyurethane almost 100%

MAJOR END USES

Polyurethane foams (mostly flexible) 85%, coatings 5%, elastomers 5%

FOREIGN TRADE

Exports—holding at about 150 million lb, imports—negligible

PRICE

\$1.00 per lb

In a year of generally modest business growth, 1986 production of toluene diisocyanate (TDI) followed suit and also apparently grew modestly. After a slow start early in the year, demand for this ingredient of polyurethane foams improved. Prices rose somewhat and plants operated at near optimum levels. Concerns over toxicity at both producing and consuming (foam manufacturing) plants apparently have eased. Investments in better facilities and improved operating techniques have led to reduced toxicity problems and may lead to greater output.

Capacity to make TDI expanded modestly in 1985 and 1986, and what expansion took place came mainly through debottlenecking programs of the several producers. TDI capacity may rise further this year. The additions brought nameplate capacity to about 690 million lb as 1987 began.

If demand growth fits recent patterns, the capacity expansions likely will almost equal the increases in demand expected during 1987. After a notable decline in output in 1985, production growth in 1986 was expected to be about 2 to 3%, or 10 million to 20 million lb, bringing total output to 630 million to 640 million lb of TDI. Consequently, the operating rates for both years ran about 94% of estimated nameplate capacity—typical of the rates for TDI plants in recent years.

Last year producers experienced a few plant operating problems that reduced output, but enough spare capacity was available to handle the small growth by both domestic and export demands during the year. Earlier in 1986, when some production was lost, export demand was stronger, and domestic demand weaker. Consequently, a supply crunch was averted. Exports of TDI last year are estimated to have held at about 150 million lb, or nearly a quarter of production, up slightly from 1985 exports. Longer term, it is expected that exports will remain near the same level.

Most U.S. consumption of TDI (large-

ly an 80/20 mixture of the 2,4- and 2,6-isomers) goes into flexible urethane foams. About 5% of consumption goes into urethane coatings, and less than 5% goes into urethane elastomers. Hence, consumption of TDI depends mainly on demand for flexible foam, the largest market for which continues to be furniture. (Bedding is considered separately.) Currently, furniture demand is strong and is expected to hold.

The next largest market for flexible foams is transportation, mostly in automotive seating. Demand last year could approximate levels of the late 1970s because output of autos held up. Unit consumption of foams, however, has declined with the downsizing of autos. Some threat to TDI consumption continues to come from *p,p'*-methylene diphenyldiisocyanate (MDI). Because molders believe that faster production is possible by using MDI and that the seat quality is better, use of TDI is slowly being replaced by MDI.

Carpet underlay (padding) ranks third in use of flexible urethane foams, and, with estimates of year-to-year variations in consumption ranging up to 50%, it appears to cycle far more than other uses. The variations in both commercial and residential carpet demands influence the cycles and upset forecasts for this use of TDI.

Bedding—largely either all-foam mattresses or topper pads for interspring mattresses—ranks fourth as a use of flexible foam. Growth in the bedding market for foams has been slow during the 1980s and is expected to remain so.

Other uses of TDI in urethane coatings, elastomers, and miscellaneous uses (mostly adhesives and sealants) are small and are growing at diverse rates. Some of these products have excellent performance characteristics, but have high costs of application or fabrication. None affected demand for TDI last year very much, nor is any expected to have much effect during this year.

Industry Restructuring Is Still Hitting Older Chemists Hard

Michael Heylin, C&EN Washington

More details of the major industrial manpower cuts that are continuing to afflict the chemical profession are available in the latest report by the American Chemical Society's Committee on Professional Relations (CPR) on such mass terminations (CPR) on such mass terminations. The report covers the investigation of seven multiple terminations that occurred between July 1985 and July 1986 and cost the jobs of as many as 400 chemists and chemical engineers.

All seven of the terminations involved older chemists with 10 or more years of service. This confirms the continuing vulnerability of experienced chemical professionals to the corporate restructurings that have pervaded the chemical and related industries in recent years. On a brighter note, the latest report indicates that those fired are tending to get somewhat better separation terms, including more generous severance pay.

By far the largest of the terminations was in Harvey, Ill., where Atlantic Richfield closed its technical center. According to terminnee reports, more than 300 jobs were lost, including many chemical professionals. Other major terminations were at PPG Industries, where about 50 chemical professionals were involuntarily separated from facilities in Lake Charles, La., and New Martinsville, W.Va., and at Betz Laboratories, where as many as 40 chemists lost their jobs in Trevose, Pa. The other terminations involved 33 chemists and chemical engineers from Henkel, 25 from Ayerst, 17 from Uniroyal, and 12 from Koppers.

The report also states that nine other mass terminations have been confirmed and are currently being

Employer compliance with ACS guidelines

These employers provided information		Approximate number of terminees	Advance notice	Severance pay	Assistance	Pension vesting	Employee service	Protection plans	Retiree privileges
American Home Products, Ayerst Laboratories (Princeton, N.J., and Rouses Point, N.Y.)		25							
Henkel (Minneapolis, Minn., and Burlington, Iowa)		33							
Koppers (Monroeville, Pa.)		12							
Uniroyal (Middleburg and Naugatuck, Conn.)		17							

These employers provided no information; hence, all ratings based on terminnee responses

Atlantic Richfield, Arco Petroleum Products (Harvey, Ill.)		250							
Betz Laboratories (Trevose, Pa.)		40				*			
PPG Industries (Lake Charles, La., and New Martinsville, W.Va.)		50							

* No information from any source.

□ Employer met or exceeded guideline standard.

▨ Two or more individuals below guideline standard.

■ Employer was substantially below guideline standard, which is defined as follows:

- Advance notice—less than two weeks.
- Assistance—no assistance rendered.
- Severance pay—less than one week per year of service.
- Employee service—more than 40% of terminnees had 10 or more years of service.
- Protection plans—no continuation of protection plans.

investigated by CPR. These involve Chesebrough-Pond's, Exxon Research & Development Laboratories, Farmland Industries, GTE Laboratories, International Minerals & Chemical, Los Alamos National Laboratory, Rorer Group, Sandoz, and Syntex Chemicals.

A mass termination is defined by CPR as a situation in which the employment of three or more chemists or chemical engineers is terminated by a single employer within

a six-month period for reasons other than continuing evidence of previously documented inadequate performance, completion of a contract, or cause. Terminations do not have to all occur at one location.

This new CPR report is the latest in a series of 24 produced by the committee since 1974. They compare the performance of employees having multiple terminations with seven standards contained in ACS's Professional Employment Guide-

lines. The seven firms investigated in this new report complied with these standards an average of 42% of the time. This compares closely with an average of 43% for the just over 200 terminations investigated in the previous 23 reports.

These reports are based on data provided by both employers and terminees. On average about two thirds of employers provide such data. For the latest report, four of the seven did so. The data from terminees are usually gathered with the aid of ACS local sections. CPR received help from the Louisiana, Pittsburgh, Princeton, Chicago, and Western Connecticut sections in preparing the latest report. CPR also asks individual members to send information on terminations. This should be addressed to: Office of Professional Relations, 1155—16th St., N.W., Washington, D.C. 20036. This office will provide, on request, copies of all CPR termination reports as well as a summary list of multiple terminations that have occurred within the past 10 years.

In addition to the length of ser-

vice of terminees and severance pay, the seven standards used in these reports are concerned with pension vesting, assistance in finding new employment, employee protection plans, advance notice, and rehire privileges.

For the latest report, CPR has formalized the criteria by which it determines if an employer has complied with, violated, or "substantially" violated each standard. An employer is deemed to be in compliance if it meets a standard on average and not more than one terminations reports treatment below the standard. A violation occurs when two or more individuals report substandard treatment, even if, on average, the standard is met. A violation is deemed "substantial" when a standard is not met on average, even if some individuals report treatment at or above the standard.

The database that the committee has to work with in making such determinations varies widely. The major challenge is identifying terminees. Once identified, terminees are apparently reasonably willing to supply information. However, those responding ranged from a high of 92% of total terminees to a low of 2%. This lowest response was for the big Atlantic Richfield shutdown at Harvey.

The guidelines state that employees with a minimum of 10 years' service should not be terminated, except for inadequate performance or cause. But all seven terminations in the latest report involved such seasoned employees. In four cases, more than 40% of those terminated had 10 or more years of service.

This performance continues the recent trend. All but five (or 9%) of the 54 terminations investigated by CPR in its six reports since 1984 involved chemical professionals with 10 or more years of service. For the previous 18 reports, compliance with this standard averaged 29%.

CPR points out that its latest report shows "the 1985-86 trend in multiple terminations toward the use of involuntary early retirement and the termination of long-term employees as operations are closed permanently." In addition, it says,

"Earlier industrial experience, with short-term shutdowns intended to ride out temporary business down cycles, resulted in a different pattern, one in which those terminated were the newest employees who could reasonably expect to be recalled to employment in the future."

In the latest report, four of the seven employers met or exceeded the standard that calls for severance pay of two weeks' pay per year of service. For the first 18 reports, this standard was complied with by only 15% of employers. For the last six reports, this percentage moved up to 28%. And for the last four reports, it was 32%.

Of the other five standards, the one calling for full pension vesting after 10 years has been complied with in 84% of the terminations examined in all 24 CPR reports. In the latest report it was complied with in all six cases for which data were available.

In the latest report all but one employer met the standard for outplacement assistance for terminees. Compliance with this standard has slightly improved in recent years and now stands at 69% for all terminations investigated.

Long-term compliance with the standard calling for extension of employee protection plans beyond the date of termination is 50%. However, in the latest report, only one employer, Ayerst, met this standard. The other six provided such protection for the severance period, but not for the recommended month beyond that.

In the latest report, three employers gave the recommended four weeks of advance notice. The other four did not do so on a consistent basis. For instance, at Henkel the average notice was more than 14 weeks. But some terminees claimed they received as little as one week. Compliance with this standard averages 38% for all 24 CPR reports.

The standard for rehire privileges simply states that such privileges should be carefully explained to terminees. Apparently this is rarely done to the satisfaction of CPR. None of the seven employers covered by the latest report did so. For all 24 reports, only one employer of seven has met this standard. □

ACS guidelines

Advance notice. Four-week minimum.

Severance pay. Minimum is two weeks per year of service. Additional notice may be given, by mutual agreement, in lieu of severance pay.

Assistance. Efforts should be made to place terminations in another position within the organization, or terminations should be given assistance to find employment elsewhere.

Pension plan vesting. Full vesting after 10 years' service.

Employee service. Those with minimum of 10 years' service should not be terminated except for continued evidence of previously documented inadequate performance or cause.

Employee protection plans. Should be extended for a minimum of one month, plus two weeks for each year of employee service, following termination at same rate of contribution as before. Employee would have additional 31-day grace period.

Rehire privileges. Rehire privileges should be carefully explained to terminees.